result which gave increased interest to the process, was the inconceivable rapidity with which the acid, under these circumstances, absorbed the ethereal vapour, which it appeared to do with greater avidity as the process advanced.

In fact, the water, in the act of congealing, flew all over the inner surface of the retort, in consequence of an explosive evolution of ethereal vapour, generated amid the aqueous particles. The congelation of the water was rendered evident to the ears as well to the eyes of his class of more than three hundred students.

Doctor Bache communicated the decease of the Hon. Jonathan Sewell, of Quebec, a member of the Society.

Stated Meeting, December 20.

Present, forty members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Appendix to Part V. of the Greenwich Observations, for the year 1834. (A missing number.) London, 1834.—*From the Royal Society of London.*

The Statutes at Large, of South Carolina. Edited under the authority of the Legislature. By Thomas Cooper, M. D., LL.D. Vol. V. Columbia, 1839.—*From Dr. Tidyman.*

A Map of the Extremity of Cape Cod. Executed under the direction of Major J. D. Graham, U. S. Top. Engrs.—*From the Author.*

Crania Americana; or, a Comparative View of the Skulls of various Aboriginal Nations of North and South America. By Samuel George Morton, M. D. Philadelphia, 1839.—*From the Author.*

Medical and Topographical Observations upon the Mediterranean; and upon Portugal, Spain, and other Countries. By G. B. R. Horner, M. D., U. S. N. Philadelphia, 1839.—*From the Author.*

The State of the Prisons in England and Wales. By John Howard, F. R. S. Warrington, 1784.—*From Mr. John Vaughan.*

State of the Prisons in England, Scotland, and Wales. By James Neild, Esq. London, 1812.—*From the same.*

The Natural History of British Insects. By E. Donovan, F.L.S. Ten Volumes. London, 1793 to 1802.—*From the same.*

The Natural History of British Birds. By E. Donovan, F.L.S. London, 1794 to 1798. Five Volumes.—*From the same.*

The Natural History of British Fishes. By E. Donovan, F.L.S. Vol. I. London, 1802.—*From the same.*

Biographical Sketches of distinguished American Naval Heroes in the War of the Revolution. By S. Putnam Waldo, Esq. Hartford, 1823.—*From the same.*

An Account, Historical, Political, and Statistical, of the United Provinces of Rio de la Plata. Translated from the Spanish of Ignacio Nunes. London, 1825.—*From the same.*

Flora Caroliniensis, or an Historical, Medical, and Economical Display of the Vegetable Kingdom. By John L. E. W. Shecut. Vol. I. Charleston, 1806.—*From the same.*

Travels in Brazil, in the Years from 1809 to 1815. By Henry Koster. Two Vols. Philadelphia, 1817.—*From the same.*

History of Spain, from the establishment of the Colony of Gades, by the Phœnicians, to the death of Ferdinand, surnamed the Sage. Two Volumes. Dublin, 1793.—*From the same.*

History of the County of Worcester, in the Commonwealth of Massachusetts. By Peter Whitney, A. M. Worcester, 1793.—*From the same.*

The First Settlers of Virginia. New York, 1806.—*From the same.*

An Introduction to the Knowledge of Rare and Valuable Editions of the Greek and Latin Classics. By the Rev. Thomas Frognall Dibdin, F.S.A. Two Volumes. London, 1808.—*From the same.*

Repertorium Commentationum a Societatibus Litterariis Editarum. Secundum Disciplinarum Ordinem Digessit, J. D. Reuss. Historia, etc. Gottingen, 1810.—*From Mr. P. S. Du Ponceau.*

Historisch Statistische Darstellung des Nördlichen Englands. Von E. F. Rivinus. Leipsic, 1824.—*From the same.*

The Ruins of Pæstum and other Compositions, in verse. Salem, 1822.—*From the same.*

Athens, and other Poems. Salem, 1824.—*From the same.*

Academical Catalogues.—*From the same.*

The American Medical Library and Intelligencer. By Robley Dunglison, M. D. Nos. 15, 16, 17 and 18.—*From the Editor.*

The Committees of Finance and Publication, respectively made their Annual Reports, which were, on motion, accepted.

Doctor Hare made the following verbal communication relative to the application of radiant heat to glass.

Dr. Hare said, it did not appear to him that sufficient attention had been paid by artists or men of science, to the great difference which existed between the effect upon glass of heating it by radiation and by conduction. When exposed to radiant heat alone, unaccompanied by flame, or a current of hot air, glass is readily penetrated by it, and is heated, within and without, with commensurate rapidity; but, in the case of its exposure to an incandescent vapour or gas, the caloric could only penetrate by the process of conduction; and, consequently, from the inferior conducting power of glass, the temperature of the outer and inner portions of the mass would be so different, as by the consequent inequality of expansion to cause the fracture, which was well known, under such circumstances, to ensue.

The combustion of anthracite coal, in an open grate, in his laboratory, having four flues of about 4.12 by 2.12 inches each, in area, just above the level of the grate, (the upper stratum of the fire, having nothing between it and the ceiling,) had allowed him to perform some operations with success, which formerly he would have considered impracticable. The fire having attained to that state of incandescence to which it easily arrives when well managed, he had, on opening a hole by means of an iron rod, so as to have a perpendicular perforation extending to the bottom of the fire, repeatedly fused the beaks of retorts of any capacity, not being more than three gallons, causing them to draw out, by the force of gravity, into a tapering tube; so that, on lifting the beak from the fire, and holding the body of the retort upright, the fused portion would hang down so as to form an angle with the rest of the beak, or to have any desired obliquity. By these means, in a series of retorts, the beak of the first might be made to descend through the tubulure of a second; the beak of the second through that of a third, and so on; the beak of the last retort in the row being made, when requisite, to enter a tube passing through ice and water in an inverted bell-glass.

By means of the anthracite fire, as above described, thick rods, as

well as stout tubes, might, as he had found, be softened and extended, or bent into suitable forms.

The lower end of a green glass phial, such as is used usually for Cologne water, might be made to draw out into a trumpet-shaped extremity. A Florence flask might be heated, and made flat, so as to answer better for some purposes. The drawing out of tubes into a tapering form, suitable for introducing liquids through retort tubulures, was thus easily effected; and in all cases the sealing of large tubes was better commenced in this way, although the blowpipe might be necessary to close a capillary opening which could not be closed by the fire.

Dr. Hare further communicated a method of preparing pure chlorohydric acid, from the impure muriatic acid of commerce, by the action of sulphuric acid.

It is known, said Dr. Hare, that concentrated sulphuric acid, when added to liquid chlorohydric acid, expels more or less of it as a gas, in consequence of its superior affinity for water. At the present low price of the ordinary acid of commerce, Dr. Hare had found it advantageous to procure the latter in purity, by subjecting it to the former.

A tubulated glass retort, having been half-filled with chlorohydric acid, sulphuric acid was allowed to drop from a glass funnel, with a cock, into a tube descending into the acid in the retort through the tubulure, to which it was luted by strips of gum-elastic. The tube terminated in a very small bore. The beak of the retort, bent in the fire, as he had just described, descended through the tubulure into the body of a small retort containing water not refrigerated. The beak of the latter descended into a larger one, half full of water, to which ice was applied. Of course the beak of the third might, in like manner, enter the body of a fourth. After an equivalent weight of sulphuric acid had been introduced, and the evolution of gas was no longer sufficiently active, heat might be applied until nearly all the chlorohydric acid should come over.

The residual diluted sulphuric acid was, with the addition of nitrate of soda or potassa, or nitric acid, as serviceable for galvanic purposes, as if it had not been thus used.

Dr. Hare further communicated a method of preparing hydrochloric acid and chlorine in the self-regulating reservoir

invented by him, and spoke of some of the applications of the gases thus prepared.

Dr. Hare was under the impression that few chemists were aware of the great advantage of the self-regulating reservoirs of gas, to which he had resorted. He was enabled, by means of them, to keep hydrogen, carbonic acid, nitric oxide, chlorine, chlorohydric acid, sulphydric acid, and arseniuretted hydrogen, so as to use any of these gases at pleasure. He had kept these reservoirs in operation for months, without taking the constituent vessels apart.

By means of the reservoir of chlorohydric acid he had been encouraged to make an effort which proved successful; to form artificial camphor by the impregnation of oil of turpentine with that gas.

Subjecting an ingot of tin to a current from his reservoir of chlorine, it was rapidly converted into the bichloride, or fuming liquor of Libavius. To his surprise the ingot was fused by the heat generated. In the last mentioned reservoir the materials were manganese, in lumps, and concentrated chlorohydric acid, diluted sulphuric acid being also introduced; as the reaction of this last mentioned acid with the manganese was more active than that of the chlorohydric acid. In fact, sulphuric acid, diluted with its weight of water and common salt, might be used without chlorohydric acid. In the reservoir for chlorohydric acid, the materials were sal ammoniac and sulphuric acid, to which some water was added, but not so much as to prevent the chlorohydric acid from assuming the gaseous state.

He had found it preferable to keep the sulphydric acid reservoir in a flue, the gas being drawn, when wanted, through a globe of water, by means of a leaden tube, at a convenient place. It would be desirable that the reservoirs of chlorine and chlorohydric acid should be similarly situated.

Mr. Sears C. Walker made an oral communication on the subject of determining longitudes from corresponding observations of meteors.

It had been recently remarked by Prof. Schumacher, Astr. Nachr. No. 283, that, so far as his information extended, no trial had been made of the observation of meteors for determining longitude; though the subject had been proposed long since by Prof. Benzenberg. Accordingly, on the 11th of August, 1839, observations, chiefly of the instant of vanishing of meteors were made at the observatories of Altona, Bremen, Konigsberg, Breslaw, &c. with such success as to

lead Dr. Olbers to the conclusion announced in a succeeding No. (284) that observations of this kind are adequate for the complete determination of longitudes of places. By means of twelve coincidences on the same night, Prof. Boguslawski found the Breslaw Observatory to be 28m 22s.07 east of Altona, differing less than a second from that which had been previously adopted.

As the subject of priority in this inquiry might be considered important, Mr. Walker deemed it his duty to communicate the substance of a letter from Prof. Alexander, of Princeton College, New Jersey, dated January 14th 1839, in which is contained the result of seven coincidences of observations of meteors, made 25th Nov. 1835, by Messrs. A. D. Bache and J. P. Espy, at the house of Prof. Bache, in Philadelphia, and by Professors Henry and Alexander, at the Philosophical Hall, 0.1*s*. east of Nassau Hall, College of New Jersey, at Princeton. As the time referred to by the Philadelphia observers is that of the University of Pennsylvania, which is about 0.7*s*, west of the State House, Philadelphia, the differences of longitude, given by Prof. Alexander, have been diminished by 0.6*s*. to reduce them to the State House, Philadelphia, and Nassau Hall, Princeton. The results are contained in the table. The time of the disappearance of the meteors was noted.

Meteor.	N. Hall, East of State House.	Comparative Weight.	Observers.
a	+2m. 0.45sec.	1	Espy and Alexander.
b	+2 „ 0.30 „	1	" and " and Henry,
c	+1 „59.20 „	0.5	" and Henry,
d	+2 „ 0 20 „	1	" and "
e	+2 „ 1.00 „	1	Bache and "
f	+2 „ 0.80 „	1	" and Alexander,
g	+2 „ 2.60 „	0.5	Espy and Henry.
	Mean according to weights	+	2 *m* 0.61 *sec.*
	S. House, W. of Greenwich	—	5*h*. 0 „ 39.12 „
	N. Hall, W. of Greenwich	—	4„ 58 „ 38.51 „ No. 1.

In order to judge of the degree of precision of this result, an extract of a letter from Robert Treat Paine, Esq. dated June 10th, 1839, was read, giving his determination of the same by transportation of three chronometers in May last, from Princeton to Castle Garden, New York, and thence to Boston, as follows:

State House, Boston	—	4h.	44m.	16.60sec.
Castle Garden, West	—		11 „	46.33 „
Nassau Hall, W. of C. Garden	—		2 „	35.14 „
Nassau Hall, W. of Greenwich	—	4 „	58 „	38.07 „ No. 2.

A further comparison was furnished from the observations of the solar eclipse of Sept. 18th, 1838, as reduced by Prof. Kendall, and from those of several occultations reduced by Mr. Walker.

Comparisons with the High School Observatory. Assumed longitude—5h. 0m. 42s. Resulting longitude of Nassau Hall,

		h.	m.	s.		
1838, Sept. 18th.	Solar Eclipse four phases,	— 4	58	37.64	weight	2.0
Nov. 21,	Im. ω Sagittarii,			34.62		1.0
Dec. 27,	Im. η Pleiadum,	— 4	58	39.42		
"	" f "			36.35	36.80	1.7
"	" h "			34.62		
1839, April 19,	" c Geminorum,			39.84		1.0
No. 3,	Mean according to weights,	— 4	58	37.25		5.7

Comparisons with the State House, Boston. Assumed longitude — 4h. 44m. 16.6s.

		h.	m.	s.		
1838, Dec. 24,	Im. ε Piscium,	— 4	58	39.56	weight	1.0
27,	Im. f Pleiadum,			36.35		1.0
1839, April 19,	Im. c Geminorum,	— 4	58	39.31		
	Do. at Dorchester Obs'y.			39.22	39.27	1.4
No. 4.	Mean according to weights	— 4	58	38.49		3.4

The Immersion of f Pleiadum was also observed by Prof. Boguslawski at the Breslaw Observatory, longitude + 1h. 8m. 10.4s., whence Nassau Hall — 4h. 58m. 41.15s. No. 5, weight 1. This result is somewhat uncertain, from the variation of the co-efficient of the unknown error ζ of the moon's tabular place on a secondary to its orbit; since we have for the longitude, $d = -$ 4h. 58m. 41.15s. $- 2.353 \times \zeta - 0.406 \times \eta$, according to Bessel's Notation.

The mean results taken with their weights gave,

	h.	m.	s.		
No. 1	— 4	58	38.51	weight	6.0
2			38.07		3.0
3			37.25		5.7
4			38.49		3.4
5			41.15		1.0
Mean according to weights	— 4	58	38.20		19.1

Thus it appears that the observations of the 25th November, 1835, lead to the same conclusion as that which was subsequently in 1839, obtained by the European astronomers.